

Percentages of indications verified, July, 1888.

States.		States.	
Maine.....	67.0	Ohio.....	81.0
New Hampshire.....	70.2	West Virginia.....	78.8
Vermont.....	72.3	Indiana.....	80.9
Massachusetts.....	68.5	Illinois.....	78.2
Rhode Island.....	69.5	Lower Michigan.....	74.7
Connecticut.....	70.4	Upper Michigan.....	75.4
Eastern New York.....	71.0	Wisconsin.....	75.1
Western New York.....	76.6	Minnesota.....	75.2
Eastern Pennsylvania.....	71.2	Iowa.....	75.4
Western Pennsylvania.....	79.8	Kansas.....	75.5
New Jersey.....	70.6	Nebraska.....	74.1
Delaware.....	72.6	Missouri.....	72.4
Maryland.....	70.7	Colorado.....	74.0
District of Columbia.....	76.3	Eastern Dakota.....	72.5
Virginia.....	76.8	Southern California*.....	87.5
North Carolina.....	79.7	Northern California*.....	88.0
South Carolina.....	79.7	Oregon*.....	78.6
Georgia.....	77.7	Washington Territory*.....	77.8
Eastern Florida.....	82.1	By elements:	
Western Florida.....	76.2	Weather.....	82.0
Alabama.....	74.8	Temperature.....	64.7
Mississippi.....	73.0		
Louisiana.....	74.3	Monthly percentage of weather and	
Texas.....	80.5	temperature combined.....	75.1
Arkansas.....	75.4		
Tennessee.....	76.2		
Kentucky.....	78.8		

* From the 1st to the 11th, inclusive, the predictions were made for twenty-four hours, beginning nine hours after the observations on which the predictions were based; during the remainder of the month they were made for thirty-six hours, beginning with the observation on which they were based. In determining the general average percentage for the different elements, the Pacific coast states have not been included.

INDICATIONS FOR 24 HOURS IN ADVANCE.

The percentages of verifications of the bi-daily indications for August, 1888, as determined from comparison of succeeding telegraphic reports, are given in the table below.

The predictions for all districts for August, 1888, were made by 1st Lieutenant Robert Craig, 4th Artillery, Acting Signal Officer and Assistant, and the verifications of the same were determined by Assistant Professor C. F. Marvin.

Percentages of indications verified, August, 1888.

States.		States.	
Maine.....	72.6	Ohio.....	81.4
New Hampshire.....	73.4	West Virginia.....	80.5
Vermont.....	75.1	Indiana.....	75.5
Massachusetts.....	80.7	Illinois.....	75.4
Rhode Island.....	85.5	Lower Michigan.....	75.1
Connecticut.....	84.8	Upper Michigan.....	79.5
Eastern New York.....	77.5	Wisconsin.....	79.5
Western New York.....	77.2	Minnesota.....	73.0
Eastern Pennsylvania.....	84.5	Iowa.....	74.3
Western Pennsylvania.....	79.4	Kansas.....	76.2
New Jersey.....	84.3	Nebraska.....	79.5
Delaware.....	89.0	Missouri.....	77.2
Maryland.....	85.2	Colorado.....	73.1
District of Columbia.....	81.0	Eastern Dakota.....	77.4
Virginia.....	83.2	Southern California.....	87.5
North Carolina.....	79.0	Northern California.....	88.0
South Carolina.....	77.3	Oregon.....	78.6
Georgia.....	72.5	Washington Territory.....	77.8
Eastern Florida.....	82.0	By elements:	
Western Florida.....	76.2	Weather.....	82.0
Alabama.....	74.6	Temperature.....	72.2
Mississippi.....	72.7		
Louisiana.....	73.3	Monthly percentage of weather and	
Texas.....	83.2	temperature combined.....	78.1
Arkansas.....	70.6		
Tennessee.....	77.5		
Kentucky.....	78.5		

The following extracts from the official instructions governing the verifications of the predictions of the Signal Service are given:

The monthly percentages of verifications of predictions of weather and temperature for each state and territory will be combined by multiplying the

respective percentages of verifications of predictions of weather by six (6), and of temperature by four (4), and dividing the sum of the respective products by ten (10). The quotient will be the average percentage of verifications of predictions of weather and temperature for the particular state or territory and month in question.

The general monthly percentage of verifications of all indications will be determined by multiplying the general monthly percentage of verifications of weather and temperature combined by five (5); of the display of cautionary and storm signals by two (2); of cold waves by one (1); and dividing the sum of the products by eight (8); except during those months in which not more than three cold-wave signals are ordered, when cold waves will be omitted and the sum of the remaining products will be divided by seven (7). The quotient will be the general monthly percentage of verification of all indications.

CAUTIONARY SIGNALS FOR JULY.

Statement showing percentage of justifications of wind signals for the month of July, 1888: Number of cautionary signals ordered, nineteen; justified, wholly or in part, sixteen. Number of storm signals ordered, two; justified, two. Number of signals ordered for easterly winds, one; justified, one. Number of signals ordered for westerly winds, eighteen; justified, fifteen. Number of storms without signals, twelve. Number signals ordered late, or after the justifying velocity had begun, six. Percentage of justifications, 58.0.

CAUTIONARY SIGNALS FOR AUGUST.

Statement showing percentage of justifications of wind signals for the month of August, 1888: Number of cautionary signals ordered, ten; justified wholly or in part, five. Number of storm signals ordered, sixteen; justified, wholly or in part, fourteen. Number of signals ordered for easterly winds, eighteen; justified, sixteen. Number of signals ordered for westerly winds, eleven; justified, five. Number of storms without signals, thirty-three. Number of signals ordered late, or after the justifying velocity had begun, three. Percentage of justifications, 45.6.

LOCAL VERIFICATIONS.

The following extracts from the published reports of the state weather services for August, 1888, show the percentages of verification of weather and temperature signals:

Indiana.—Crawfordsville: During the month the temperature signals received were verified each day, but the weather signals missed seven times.

Worthington: Twenty-one weather predictions were verified, and five not verified; twenty-four temperature predictions were verified, and two not verified.

Michigan.—Weather signals are now displayed in one hundred and thirty-two towns in the state, and upon the baggage-cars of twenty-six trains of eight of the principal railroads of the state.

The indications are issued at 10 p. m., daily, from the Chief Signal Office, Washington, and are for the twenty-four hours from 7 a. m. to 7 a. m.

The percentage of verification of these indications for August is as follows (the verification is taken from reports of displaymen furnished this office monthly): temperature, 77.7 per cent; weather, 70.3 per cent.; temperature and weather, 74.0 per cent.

Weather signals are displayed on the baggage cars of the following railroads: C. & G. T. R'y; D. G. H. & M. R'y; D. D. G. T. R'y; M. C., main line and branches; C. & W. M. R'y; G. R. & I. R'y; P. H. & N. W. R'y; and the P. O. & P. A. R'y.

Minnesota.—The verification of weather signals were: 77 per cent. for weather, and 80 per cent. for temperature.

Nebraska.—The percentages of correct weather predictions for the state were: temperature, 89.6; weather, 88.1; mean, 88.8.

South Carolina.—The percentage of verification of the weather and temperature predictions for the state was: weather, 70.0; temperature, 88.0.

Tennessee.—The percentage of verification of weather and temperature predictions for the month at the following stations were: Jonesborough, weather, 96.3; temperature, 96.3. Clarksville, weather, 63.0; temperature, 88.8. Mason, weather, 96.3; temperature, 96.3.

STATE WEATHER SERVICES.

The following extracts are republished from reports for August, 1888, of the directors of the various state weather services:

ALABAMA.

The month opened with the rainfall about an average and the crops greatly benefited by the favorable season, but towards the close the rains were almost continuous, and during this period farming interests were greatly damaged. This condition of the weather was evidently produced by the range of atmospheric pressure over the United States during the month. On the 7th low

pressure occurred in northwestern Texas and high in the northeastern and northwestern portions of the United States. The result of the struggle between these two opposing forces was rain over the Gulf States from the 4th to the 8th. On the 18th, 19th, and 20th low barometer was recorded in the Gulf States and high off the Atlantic and in the Northern States. On the 20th the low pressure began to move northeastward, and heavy rains were produced in Alabama. From the 21st to the 29th low pressure was forced

to the northeast and northwest and high pressure was indicated in Tennessee and the Middle States. This condition produced fair weather, with a small precipitation in Alabama. From the 29th until the close of the month the extreme low barometer on the Gulf produced strong winds along the borders of the Gulf and easterly winds, with rains, over Alabama. These rains were still falling at the close of the month, with tornadic tendencies on the coast and in middle Alabama. The total rainfall for August was 2.01 inches above the normal.

The temperature during the first week was high and quite oppressive in some localities, but the month ended with pleasant nights and the heat of the days very much moderated. The average temperature was 2° 4 below normal.

Summary.

Temperature (in degrees Fahr.).—Monthly mean, 78.3; highest monthly mean, 82.4, at Selma; lowest monthly mean, 71.5, at Tuscaloosa; maximum, 98, at Marion and Fort Deposit, on the 2d and 3d; minimum, 52, at Fort Deposit, on the 25th; range for the state, 46; greatest local monthly range, 42, at Fort Deposit; least local monthly range, 23, at Bermuda and Troy.

Precipitation (in inches).—Average for the state, 7.25; greatest, 14.35, at Mobile; least, 1.91, at Pine Apple.

Wind.—Prevailing direction, southeast.—*P. H. Mell, jr., Signal Corps, Auburn, director.*

ILLINOIS.

August has been an unusual month in many respects. Its temperature has been below the average of the last ten years, and its rainfall very irregular—in some instances far above the average, and in others far below. The mean temperature of the state was 2° 1 below the average of the last ten years, distributed as follows: northern division, 1° 6; central, 2° 2, and the southern, 2° 5. The first four days were extremely hot—the 2d being the hottest—but during all the rest of the month the weather was cooler than usual.

The following are the departures from the mean at a few of the stations where the records cover a number of years: at Peoria it was 2° 4 below the mean of thirty-two years; at Marengo, 2° 5 below the mean of twenty-seven years; at Chicago, 2° 2 below the mean of seventeen years; at Springfield, 4° 2 below the mean of nine years; at Oswego, 1° 6 below the mean of eight years; at Saint Louis, 3° 8 below the mean of seventeen years, and at Cairo, 3° 2 below the mean of seventeen years. It will thus be seen that this great depression of temperature below the mean prevailed all over the state, and has added to the already large deficiency of the previous months. At Chicago it is 73° 1; at Springfield, 87° 8; at Saint Louis, 47° 6, and at Cairo, 47° 0. To the northward and westward this deficiency increased rapidly. At Marquette, Mich., it was 129° 3; at Saint Paul, 135° 4; at La Crosse, 141° 5; at Davenport, Iowa, 104° 7, and at Keokuk, 90° 9.

The monthly rainfall was below the average of ten years in both northern and central divisions, but in the southern it was far above, so that the total average for the month, 4.09 inches, was 0.80 inch above the average. It was mostly in the form of showers, some of which were extremely heavy, but seldom very extensive in range. In many instances torrents poured down in one county, while in an adjoining one but little fell. There were a few heavy showers in the northern and central divisions of the state, but by far the greater number occurred in the southern division. At Marengo 2.50 inches fell on the 16th in a little over five hours; 2.80 inches fell at Sycamore on the same day; 3.00 inches at Joliet, and 2.10 inches at Oneida on the 15th; 2.00 inches at Pana and White Hall on the 6th. At Jordan's Grove, Randolph Co., 3.55 inches fell on the 20th between 8 and 9 p. m. At the same place 1.20 inches fell in thirty-five minutes on the morning of the 4th. At Irish-town, Clinton Co., 2.42 inches fell on the 18th; at Saint Louis, 2.46 inches on the 26th; at Richview, 2.34 inches on the 6th, and at McLeansborough, 2.09 inches on the 4th. Rainfalls of over an inch were numerous.

Several light frosts occurred in the northern part of the state, but no damage was reported.—*Col. Charles F. Mills, Springfield, director; James Cassidy, Sergeant, Signal Corps, assistant.*

INDIANA.

The temperature during the month after the 4th was cool throughout, and the monthly mean much below the normal. The means from the 1st to the 4th and from the 15th to the 17th alone were above the normal. Maximum temperatures above 90° occurred from the 1st to the 3d; the highest occurred nearly everywhere on the 3d, and the lowest was noted on the 23d, when the high barometric area approached the state. The change in temperature was only gradual; abrupt changes from a higher to a lower were only noted on the 9th, 12th, and 20th, and from a lower to a higher on the 13th and 24th. Light hoar frost was reported from a few places on the 23d.

Rainy days were quite frequent, but the amount was badly distributed. In the southern portions the total amount was large and much above the average precipitation for August, while in the northern portions only small amounts, much below the average, were measured. The total monthly measurements throughout the state ranged from 0.30 to 11.59 inches. Dew occurred very frequent during the first half of the month, less so during the latter. Thunderstorms, especially in the southern portions, occurred on many dates, but a few only were accompanied by strong, destructive winds, notably those on the 7th, which caused some damage at several places.—*Prof. H. A. Huston, Lafayette, director; C. F. R. Wappenhans, Sergeant, Signal Corps, assistant.*

IOWA.

The mean temperature of the air was 1° below normal. The middle decade was cold, averaging 3° below normal. The first four days of the month were

hot, cases of sunstroke occurring on the 1st and 2d; the seven days from the 8th to the 14th were decidedly cool, averaging nearly 10° below normal. No frost occurred during the month, except in the northeastern portion of the state where a light hoar frost was reported.

The first half of the month was generally rainy or showery, local rains occurring on each and every day in some part of the state until the 16th; the last half was fine and dry, very favorable to the ripening of corn and for farm work and fairs, hardly any rain falling during that time. The total rainfall averaged about normal for the state, though it was quite unevenly distributed. The lowest amount, 2.00 inches, is reported from Waterloo; the highest, 8.50 inches, at Corning, Adams Co. Nearly the entire south and west received from 4.00 inches upwards, while the northeast averaged about 2.50 inches.—*Gustavus Hinrichs, Iowa City, director.*

KANSAS.

The temperature has ranged below the normal over the entire state, the greatest deficiency occurring in the central-eastern counties. In Leavenworth and Wyandotte it is 4°. South and west this diminishes, being but 1° 8 in Montgomery and 1° 7 in Ford.

The average precipitation for the state is 4.39 inches. In the eastern division it is 5.69 inches; in the middle, 3.96 inches; and in the western, 3.51 inches. The largest monthly rainfall is 10.00 inches and occurred in Haskell county. Wyandotte very nearly equals it, while Leavenworth comes next with 9.23 inches. Johnson and Douglas in the east and Grant in the west are next in order, while the contiguous portions of Lyon, Chase, Butler, and Greenwood also received 9.00 inches. The belt of heavy rainfall lies in a direction from southwest to northeast, from Pratt and Barber to Leavenworth and Johnson, with another area covering the extreme southwestern counties. The line of minimum rainfall extends from Stafford to Trego and Gove, and occurs again in Decatur and Rawlins. The heavy rainfalls are certainly unusual for August. It is the largest August rainfall on Professor Snow's twenty-year record, or on the Signal Service's eighteen-year record at Leavenworth, and has been exceeded but twice on the fifty-year record at Fort Leavenworth, viz., 1855 it was 10.18 inches and in 1865 it was 9.66 inches. In August, 1876, the State Agricultural College at Manhattan received 10.70 inches and Fort Riley 12.86 inches, while in 1880 Fort Riley received 10.20 inches and Washburn College 9.11 inches. In 1870 Atchison measured 13.10 inches for August and Holton 11.25 inches. In August, 1868, at Council Grove 15.35 inches fell and at Olathe 14.40 inches, while for August, 1865, Olathe measured 13.10 inches. At Paola, in August, 1869, they had 9.75 inches, and in August, 1870, 9.78 inches.

The close of the month finds the corn crop so far advanced as to be practically independent of any further meteorological influences, a large part of it being already cut and in the shock, while new corn is already on the market to no inconsiderable extent.

Summary.

Temperature (in degrees Fahr.).—Monthly mean, 76; highest monthly mean, 82, at Dorrance; lowest monthly mean, 69, at Goodland; maximum, 113, at Brookville on 14th; minimum, 42, at Ellsworth, on the 26th and 28th; range for state, 71; greatest local monthly range, 62, at Ellsworth; least local monthly range, 41, at Sedan; greatest daily range, 40, at Goodland, on the 13th; least daily range, 2, on the 17th, at Coldwater.

Precipitation (in inches).—Average for the state, 4.39; greatest, 10.00, at Santa Fe; least, 1.04, at Gibson.

Wind.—Prevailing direction, southeast.—*Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Sergeant, Signal Corps, assistant.*

LOUISIANA.

The month of August, 1888, will be long remembered in the meteorological history of southern and eastern Louisiana for its excessive rainfall and high wind, the greatest on record for the past fifty years. The latter part of the month, from the 14th to the close, was particularly destructive in the eastern part of the state: the heavy rains and high winds of the 15th damaged the cane and cotton, only to be followed by the hurricane of the 19th and 20th, to add to the general devastation, since which date, the daily excessive rainfalls have added to the injury, so that at the present time there is probably 25 per cent. of the crops of the state ruined. The western section of the state escaped these disasters, and reports from that section show that the meteorological conditions of the month had a beneficial effect on vegetation.

Summary.

Temperature (in degrees Fahr.).—The average temperature for the month of August, 1888, 80.8, was 0.9 below the normal for the state for that month of past seventeen years, the greatest local departures from the monthly means occurring in the extreme northern and southern sections. The highest temperature recorded during the month was 102.5, at Liberty Hill, on the 7th, and the lowest, 65, at the North Louisiana Experimental station and Baton Rouge. The prevailing dates of the occurrence of the highest temperatures were the 1st and 2d, and of the lowest, from 23d to 27th.

Precipitation (in inches).—The average rainfall for the past month was 10.84, which was 6.69 above the normal August rainfall for the state. In the northern section the average fall, 6.85, was 3.78 above the normal for that section; the average for the southern section, 14.83, was 9.15 above the normal for that portion. Excepting in the northwestern part of the state the local rainfalls reported for the month are all greatly in excess of the normals for the various parishes, and in many the amounts are greatly in excess of any monthly rainfall on record. At New Orleans the excess over the normal

amounted to 16.71; at Amite it was 11.99 above; and at Mandeville 10.57 above.—*R. E. Kerkam, Sergeant, Signal Corps, New Orleans, in charge.*

MICHIGAN.

Temperature (in degrees Fahr.).—The mean temperature for August, 66.3, is 2.1 below the normal of thirteen years. The temperature was below the normal in all sections during August, the greatest deficiency occurring in the Upper Peninsula, and the least in the southern section. The mean daily temperature was above the normal on ten days, below on twenty days, and normal one day. The highest mean daily temperature, 77, occurred on the 3d, when the temperature was 7 above the normal, and the lowest, 57, occurred on the 13th and 22d, when the temperature was 12 and 11, respectively, below the normal. The highest mean daily temperature for the past thirteen years, 82, occurred on the 30th, 1881, and the lowest, 53, occurred on the 26th, 1885 and 1887. The highest monthly temperature, 73.2, occurred in 1876, and the lowest, 63.0, occurred in 1885. The maximum temperature, 98, occurred at Bell Branch and Berlin, on the 3d, and the minimum, 28, occurred at Iona, on the 28th.

Precipitation (in inches).—The average amount of precipitation for August, 2.48, is 0.72 below the normal of thirteen years. The precipitation was below the normal in the Upper Peninsula, central and southern sections, and above the normal in the northern section. The greatest deficiency occurred in Cass county, where but 0.10 fell, and is 2.38 below the average for the state. The largest rainfall occurred in Mecosta county, where 7.37 was recorded at Big Rapids, and the next largest, 6.00, at Chase, Lake Co. Of the heavy rainfall at Big Rapids, 4.90 was recorded on the 14th and 15th. A large rainfall is recorded at Detroit on the 4th, the amount in twenty-four hours being 3.90. General rains fell on the 2d, 3d, 4th, 6th, 7th, 11th, 12th, 14th, 15th, and 16th, and local rains on the 21st, 30th, and 31st. Seventeen stations report a fall of 1.00, or more, in twenty-four hours during the month. The drought was general in the central and southern sections from the 18th to the 31st, and in many localities the drought was not broken on that date. The drought was most severe in the southwestern part of the southern section, and the crops have been seriously affected. Comparing the precipitation for August with the records of the past twelve years it is found that the largest monthly rainfall, 6.05, occurred in 1882, and the least, 1.12, occurred in 1883.

The precipitation for August, 1887, was 1.95, or 0.54 below the record for this year. Thunder-storms were reported in the different sections on twenty-three days. The average number of days on which 0.01, or more, of precipitation was recorded in the different sections is as follows: Upper Peninsula, 10.2; northern section, 7.9; central section, 7.9; southern section, 6.8; for the state, 7.8.—*N. B. Conger, Sergeant, Signal Corps, Lansing, director.*

MINNESOTA.

A notable feature of the month of August was the early occurrence of the first frost of the season in the northern part of the state. The first light frost was noted at Saint Vincent and Grand Forks on the 9th, and Moorhead on the 17th. This early frost damaged the wheat and other crops in northern Minnesota and Dakota. First frosts of previous years, in the upper part of the state, are recorded as follows: Saint Vincent, September 13, 1880; September 6, 1881; September 20, 1882; September 8, 1883; September 20, 1884; August 24, 1885; August 31, 1886 (light); August 18, 1887 (light). Moorhead, September 15, 1881; September 20, 1882; September 8, 1883; October 4, 1884; August 25, 1885; August 31, 1886 (light); August 24, 1887 (light). It will be seen by comparison that frost occurred one week earlier this year than in either of the eight years preceding.

Temperature (in degrees Fahr.).—The temperature for the past month was in general a little more than 3 below the August normal for the state, which is about 66.5. The deficiency was 4.7 at La Crosse, 3.5 at Saint Paul, 3.2 at Saint Vincent, 2.3 at Duluth and Moorhead, and 1.2 at Minneapolis. The highest temperature, 98, was reported at Grand Meadow, on the 2d, and the same at Spring Valley, on the 3d; the lowest, 30.4, was at Saint Vincent, on the 17th; range for the state, 67.6.

Precipitation (in inches).—The rainfall was in excess in the southwestern part of the state, also in the vicinity of Lake Superior; it was deficient elsewhere. In the latitude of Saint Paul and Minneapolis there was only 61 per cent. of the average August precipitation; at Moorhead only 34 per cent., and at Saint Vincent, where the deficiency was greatest, the rainfall amounted to only 19 per cent. of the seasonable average. The precipitation was also unequally distributed as to time. All of it fell in the period from the 1st to the 21st, and none was reported from any station during the last ten days of the month. The greatest daily amounts were as follows: Duluth, 2.80, on the 3d; La Crosse, 2.22, on the 3d; 1.42, on the 5th, and 1.14, on the 6th; Farmington, 1.50, on the 4th; Pine River Dam, 1.28, on the 1st; Grand Meadow, 1.07, on the 2d, and 1.00 on the 19th; Northfield, 1.00, on the 2d.

Wind.—The prevailing direction of wind, southwest.—*Prof. W. W. Payne, Northfield, director; John Healy, Private, Signal Corps, Saint Paul, assistant.*

MISSISSIPPI.

Summary.

Temperature (in degrees Fahr.).—Monthly mean, 80; highest monthly mean, 84, at Columbus; lowest monthly mean, 77, at Memphis; maximum, 106, at Columbus, on 2d; minimum, 56, at Aberdeen, on 23d; range for state, 50; greatest local monthly range, 44, at Corinth; least local monthly range, 15, at Pearlington; greatest daily range, 38, at Corinth, on 14th; least daily range, 1, on 15th, at Pearlington.

Precipitation (in inches).—Average for the state, 8.25; greatest, 29.08, at Biloxi; least, 3.04, at Macon.—*Prof. R. B. Fulton, Oxford, director; M. J. Wright, jr., Sergeant, Signal Corps, assistant.*

MISSOURI.

The average temperature for August was 74°. The highest temperature reported in the state was 110° at Pro Tem, and the lowest 45° at Ironton. The average of maximum temperatures was 99°.2, and the average of minimum temperatures, 54°, making an average monthly range of 45°.

The average precipitation was 7.02 inches, which was considerably above the normal for August. The greatest amount reported was 11.53 inches at Pro Tem, and the least was 2.07 inches at Keokuk, Iowa. The average number of days on which rain fell was 11.

Thunder-storms extended over the greater part of the state on the 3d, 5th, 6th, 7th, 11th, 12th, and 21st. Of these, the severest occurred on the 6th, 11th, and 12th. Thunder-storms of a more local character occurred on nearly every other date.—*Prof. Francis E. Nipher, Saint Louis, director; G. A. Weber, Sergeant, Signal Corps, assistant.*

NEBRASKA.

The month has been one of extremes of temperature, but on the whole cool, with precipitation varying widely in amount in different localities but averaging about as usual, and well-distributed throughout the month.

The normal temperature for August is 73°.8 and the extremes for the past ten years have been 101°.5 and 38°, both in 1887. The past month has given a mean temperature of 72°.1, a maximum of 103° at Culbertson, and a minimum of 34° at Hay Springs, with a slight frost, which is unprecedented for August. The number of very warm days has been low.

The greatest rainfall has been along the Missouri River, and especially in three localities, the southeast corner of the state, the mouth of the Platte, and the northeastern corner; another centre of heavy rainfall is in Kearney county. North Platte and Crete show the greatest deficiencies, and elsewhere the rainfall has been about normal. The number of rainy days has been about the normal, as well as the number of cloudy days. On the whole the weather has been exceedingly favorable for the growth of crops.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Corporal, Signal Corps, assistant.*

NEVADA.

The highest temperature reported was 119° at Rioville, Lincoln Co., for five days, from the 23d to 28th; the lowest temperature reported was 26°.0, on the 23d, at Austin. The hottest days reported generally were the 8th, 12th, 23d, and 25th, and the coldest periods were about the 2d, 15th, and 18th.

The usual remarkably large number of sunny days, almost destitute of moisture in the air, occurred. All persons suffering from lung troubles must necessarily derive great benefit from this dry air, although it may not be perceptible to them at the time.

The vapor in crossing the mountains was forced up and condensed on them as heretofore. A very extraordinary exception to this, however, occurred at Pioche, Lincoln Co., on the 14th instant, where 3.04 inches fell from 2 to 4.30 p. m. This storm evidently traveled from se. to nw., as 0.14 of an inch fell at El Dorado Canyon on the 14th, 0.25 at Ely on the 14th, 0.06 at Eureka on the 15th, a trace each at Carson City and Wellington on the 16th, and 0.20 at Lewers' Ranch on the 16th.

The thunder-storms, except those of the 14th and 16th at Carson City, were few and unimportant, and occurred on the 12th, 20th, and 30th only.

A heavy frost occurred on the 1st and 2d, damaging tender plants in exposed places. A light frost occurred on the 31st.—*Prof. Charles W. Friend, Carson City, director; E. H. Thompson, Private, Signal Corps, assistant.*

NEW ENGLAND METEOROLOGICAL SOCIETY.

Summary.

Temperature (in degrees Fahr.).—Monthly mean, 67.3 (ninety-eight stations); highest monthly mean, 72, at Olneyville; lowest monthly mean, 60, at Berlin Falls; maximum, 98, at Stratford, on the 3d; minimum, 30, at Williamstown, on the 29th; range for New England, 68; greatest local monthly range, 57, at Stratford; least local monthly range, 26, at Block Island; greatest daily range, 42, at Berlin Falls, on the 3d; least daily range, 0, at Manchester, on the 6th.

Precipitation (in inches).—Average for New England, 5.25 (one hundred and twenty-six stations); greatest, 9.50, at Walpole; least, 0.83, at Nantucket.

Wind.—Prevailing direction, southwest (ten stations).—*Prof. William H. Niles, Boston, Mass., president; Prof. Winslow Upton, Providence, R. I., secretary; O. N. Oswell, Sergeant, Signal Corps, assistant.*

NEW JERSEY.

The mean temperature, 72°.5, is 0°.5 above the average determined from past records of fifty stations. The highest temperatures, above 90°, were recorded at all stations except one on the 4th, 5th, 7th, 8th, and 16th, and the lowest, below 50°, at fifteen stations on the 18th, 22d, 23d, 28th, 29th, 30th, and 31st. The maximum for the month, 98°, was recorded at Tenafly and Oceanic on the 16th, and the minimum, 41°, at Hanover on the 29th.

The average rainfall for the state, 6.13 inches, is 1.39 inches above the average determined from past records of fifty stations. The largest amount reported was 10.53 inches, at Plainfield, Union Co., and the smallest, 2.55 inches, at Egg Harbor City, Atlantic Co.

Summary.

Temperature (in degrees Fahr.).—Monthly mean, 72.5; highest monthly

mean, 77.0, at Trenton; lowest monthly mean, 68.6, at Hanover; maximum, 98, at Oceanic and Tenafl, on 16th; minimum, 41, at Hanover, on the 29th; range for state, 57.0; greatest local monthly range, 53.0, at Tenafl; least local monthly range, 29.0, at Ocean City; greatest daily range, 40.5, at Freehold, on the 30th; least daily range, 2.0, at Lambertville, on the 12th.

Precipitation (in inches).—Average for the state, 6.13; greatest, 10.53, at Plainfield; least, 2.55, at Egg Harbor City.—*Prof. George H. Cook, New Brunswick, director; E. W. McGann, Sergeant, Signal Corps, assistant.*

NORTH CAROLINA.

Temperature (in degrees Fahr.).—Monthly mean, 76.9; highest monthly mean, 80.2, at Southport; lowest monthly mean, 74, at Knoxville, Tenn.; maximum, 102.4, at Kitty Hawk, on the 8th; minimum, 48.5, at Mount Pleasant, on the 24th; range for state, 53.9; greatest local monthly range, 48.5, at Mount Pleasant; least local monthly range, 25.6, at Hatteras.

Precipitation (in inches).—Average for the state, 4.57; greatest, 9.25, at Southport; least, 2.21, at Kitty Hawk.

Wind.—Prevailing direction, southwest.—*Dr. Herbert B. Battle, Raleigh, director; H. McP. Baldwin, Sergeant, Signal Corps, assistant.*

OHIO.

Temperature (in degrees Fahr.).—The mean temperature of the northern section, 69.2, was 0.9 above the average; the means for the middle and southern sections, 70 and 71.8, respectively, agree exactly with the six-year means for the sections. The mean for the state, 70.4, is 0.4 above the average. The maximum temperature, 102.0, occurred at Logan, on the 3d, and the minimum, 35.0, at Paulding, on the 23d. The mean daily range of temperature, 21.1, is 1.3 below the average for the past six years. The greatest daily range was, 42.6, at Wauseon, on the 29th, and the least, 3.0, at Georgetown, on the 21st. Light frost was reported on the 23d from Sidney, Greenville, Wauseon, Paulding, Newcomerstown, and Canton, on the 28th from Wauseon, and on the 29th from Newcomerstown.

Precipitation (in inches).—General and heavy rains occurred in all sections on the 4th, 7th, 8th, 12th, 16th, 17th, and 21st, and in the southern section on the 18th, 27th, and 31st; general though mostly light rains in all sections on the 1st, 3d, and 6th; local rains in northern section on the 2d, 11th, 31st; in the middle section on the 5th, 20th, and 31st; and in the southern section on the 2d and 5th. The heaviest rainfall in any twenty-four consecutive hours, 8.63, occurred at McConnellsville on the 17th. The rainfall for the northern section was 3.06; for the middle section, 5.70; for the southern section, 7.18. These means are 1.22, 2.07, and 3.30 above the averages for the sections. The mean rainfall for the state, 5.16, was 1.71 above the mean for the month, making the total for the year to September 1 to agree with the six-year average. Thunder-storms were general in all sections on the 1st, 2d, 3d, 4th, 7th, 8th, 11th, 12th, 16th, 17th, 27th, and 30th.—*Prof. B. F. Thomas, Columbus, director; Lieut. Charles E. Kilbourne, secretary; C. M. Strong, Private, Signal Corps, assistant.*

PENNSYLVANIA.

Temperature (in degrees Fahr.).—The mean monthly temperature, 69.5, is about 2.8 below the average. The greatest departures were in the western portion of the state. Philadelphia was exactly normal. The highest temperatures during the month occurred on the 4th, 8th, and 16th, and were about the same as usually recorded. The coldest periods were the 23d, 28th, and 29th, and the temperature ranged about 3 below that generally observed during August. The maximums were: Lock Haven, 100; Chambersburg, New Bloomfield, and York, 98; Philadelphia and Catawissa, 97.5; Reading, Pottstown, Shamokin, and Selin's Grove, 97. Minimums: Phillipsburg and Somerset, 33; Wellsborough, 34; Bernice, 37; Greenville, 37.8; Smethport, Dyberry, and Charlesville, 38; Honesdale, 39.

Precipitation (in inches).—The rainfall for the month was phenomenal. Its average for the state was 7.05, being nearly 3.00 more than the normal. The excess was largely due to the excessive fall on the 21st. The following totals occurred during this storm: Girardville, 5.65; Selin's Grove, 5.20; Kutztown, 5.07; Huntingdon, 4.80; Lebanon, 4.76; New Bloomfield, 4.75; Scisholtzville and Hollidaysburg, 4.72; Uniontown, 4.53; Reading, 4.52; Somerset, 4.50; Johnstown, 4.49. Other heavy rainfalls occurred on the 12th and 17th. The largest monthly totals were: Drifton, 11.27; Kutztown, 10.95; Indiana, 10.65; Uniontown, 10.23; Selins Grove, 10.12. The only severe storm during the month was on the 21st. The weather was generally favorable for agricultural pursuits. A few light frosts were reported. The corn crop promises to be a large one, and the potato yield above the average. Average number of rainy days, 10; clear, 18; fair, 10; cloudy, 8.

Wind.—Prevailing direction, southwest.—*Under direction of the Franklin Institute, Philadelphia; T. F. Townsend, Sergeant, Signal Corps, assistant, in charge.*

SOUTH CAROLINA.

The mean temperature of the month, according to reports rendered, was 77°.8, a similar mean temperature being on record for the same period in 1887.

The mean depth of rainfall was 4.53 inches for the month, while the record for August, 1887, shows a mean depth of 6.54 inches, a deficiency of 2.01 inches as compared with the same period last year. The greatest amount of precipitation occurred at Windsor, where a fall of 6.90 inches was reported for the month. The rainfall, partial in places, gives promise of average crops.

Summary.

Temperature (in degrees Fahr.).—Monthly mean, 77.8; highest monthly mean, 82.0, at Timmons ville; lowest monthly mean, 74.9, at Marion; maxi-

mum, 102.5, at Clinton; minimum, 50.0, at Cedar Springs and Hardeeville; range of temperature for the state, 19.4; greatest local monthly range, 27.7, at Brewer's Mines; least local monthly range, 13.0, at Charleston.

Precipitation (in inches).—Mean depth of rainfall, 4.53; greatest monthly rainfall, 6.90, at Windsor; least monthly rainfall, 1.52, at Kingstree; average number of rainy days, 10.0, as against 11.4 for August, 1887.

Wind.—Prevailing direction, southwest.—*Hon. A. P. Butler, Columbia, director; H. C. Seymour, Private, Signal Corps, assistant.*

TENNESSEE.

The meteorological conditions showed several abnormal features, the chief of which were the severe gale of the 20th and 21st and the excessive rainfall during the last half of the month, together with the large percentage of cloudiness.

The mean temperature was 76°.2, one degree above the August mean of the past six years. The highest local mean was 81°, at Woodstock, and the lowest, 72°.2, at Fostoria. The maximum temperature observed was 104°, on the 1st and 2d, at Hohenwald, and was the highest in August during the past six years, the next being 103°, in 1886 and 1887. The maximum temperatures were generally high, 98° and 99° being recorded at several stations. The minimum temperature observed was 50°, on the 24th, at Jacksborough; this was the highest August minimum during the six years, except that in 1886, 52°, and 1885, 50°. The mean daily ranges of temperature were slightly less than the normal. The highest temperature was generally recorded on the 2d and 3d in the eastern and middle divisions, and on the 1st, 2d, and 5th in the western division. The lowest temperature was generally recorded on the 23d and 24th, although at a few stations in the middle and western divisions the lowest was noted on the 10th, 13th, and 14th.

The mean precipitation was 7.06 inches, much of which, especially in the middle division, fell on the last four days of the month. Of this amount, the eastern division received an average of about 4.5 inches, the middle division about 7.75 inches, and the western division nearly 9 inches. Until the 16th the rains were mostly light and local, but from that time to the end of the month, excepting the cool period, 23d to 26th, inclusive, the rains were almost daily, and in many instances very heavy. The greatest rainfall was at Ashwood, 11.93 inches, and of this amount, 8.59 inches fell during the four days ending with the 31st, and on that day 5.44 inches fell at that station; for August this is probably unprecedented in the history of that country.—*J. D. Plunket, M. D., Nashville, director; H. C. Rate, Signal Corps, assistant.*

TEXAS.

The data used in this review comprises monthly reports and summaries from sixteen special cotton-region stations, nine regular stations of the Signal Service, seven voluntary observers, and the 8 a. m. weather maps issued at Galveston. The weather maps for August exhibit some unusual meteorological features: First, there was extremely hot weather which was abruptly terminated and followed by exceptionally cool weather. Second, excessive precipitation occurred at widely-separated stations, while at intermediate stations there was scarcely the normal amount. Thus at Galveston, in less than seventy-two hours, over twelve inches of rain fell, while at Houston, fifty miles distant, less than three inches were reported. Again, at Tyler, in less than four days, over thirteen inches fell, while at Longview, there was less than one-sixth of that amount. During the first of the month dry and hot weather prevailed. After the 10th there was a change to cooler, which conditions continued, with light showers here and there, until the 22d, when copious rains set in along the coast, and, during the next eight days, gradually extended northward through the state producing decidedly cool weather, which continued to the end of the month. During the heated term, from the 1st to the 10th, intensely hot weather existed in the Northern States, the temperature at various points in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Ohio, and Wisconsin ranging from 92° to 105°. In Chicago and Saint Louis, there were scores of prostrations and deaths. Shops and factories were compelled to shut down, and farm hands were driven to shelter. Yet in Texas the temperature was not abnormally high and there were few, if any, fatalities.

Temperature (in degrees Fahr.).—The average temperature for the state for August, was 82; the mean maximum temperature was 92; and the mean minimum temperature 73. Compared with the month of July, the average temperature for August was one degree lower. The highest temperature reported at any station was 104, at Fort Elliott, on the 5th, and Rio Grande City, on the 19th. The lowest temperature, 57, occurred at Fort Elliott on the 31st. The absolute range of temperature for the state was 47. The greatest monthly range of temperature was 47, at Fort Elliott; and the least monthly range, 21, at Corpus Christi. Average range along the coast 22; in the interior, 33. The highest monthly mean temperature at any station was 87.6, at Cuero; lowest, 73.9, at Fort Elliott.

Precipitation (in inches).—The average rainfall for Texas for August was 5.48. This amount is 3.23 in excess of the average for July of this year, and somewhat in excess of the average for August as deduced from observations covering a period of several years. The average monthly precipitation for April, May, June, July, and August was 5.10. The following named places report monthly precipitation exceeding five inches: Austin, Cleburne, Cedar Hill, Dallas, Decatur, Galveston, Luling, San Antonio and Tyler; and the following named places amounts exceeding ten inches: Dallas, Galveston, and Tyler. The greatest amount of precipitation in any twenty-four hours occurred at Galveston on the 24th, 5.96. The greatest monthly precipitation at any station was 17.85, at Tyler; and the least, 95, at Brownsville.—*S. O. Young, M. D., Galveston, director; Allen Buell, Sergeant, Signal Corps, assistant.*